



August 26, 2010

Ms. Diana Messina
California Regional Water Quality Control Board
Central Valley Region
11020 Sun Center Drive #200
Rancho Cordova, CA 95670

RE: Amended City of Live Oak Compliance Extension Request Infeasibility Analysis

Dear Ms. Messina:

The City submitted to the Regional Water Board a Compliance Extension Request Infeasibility Analysis dated July 19, 2010. The City is providing this amended City of Live Oak Compliance Extension Request Infeasibility Analysis submittal to replace the previously submitted Request/Analysis. The only significant amendment to the Request/Analysis is the extension of the final compliance schedule for ammonia and arsenic. The changes are necessary due to an error made related to estimated time required to reach compliance with the tentative permit limitations. The City requested their design engineer Eco:Logic to prepare a compliance schedule. See attached letter from Eco:Logic Mr. Michael Harrison to Mr. Bill Lewis dated August 24, 2010.

Based on the proposed effluent limitation in the Preliminary Draft Waste Discharge Requirements (PDWDRs) for the City of Live Oak (City) dated June 2010, the City believes its current pond wastewater treatment plant (WWTP) and the new activated sludge WWTP being constructed will not comply with many of the effluent limitations reliably, either near-term or long-term, without potentially significant modifications and costs.

Assessments of probable reliable compliance with the PDWDR effluent limitations for the existing pond WWTP and new WWTP are presented in Table 1. In the City's specific situation, the existing pond WWTP is expected to remain in operation until mid-2012 when the new activated sludge WWTP currently under construction will begin start-up. The City's current Cease and Desist Order (CDO) recognizes this reality and sets appropriate effluent limitations for on-going effluent discharges from the existing WWTP. When the new WWTP is started up, it will need time to reach an operational state. However, even when operational, the City's new WWTP may not comply reliably with many of the effluent limitations in the PDWDRs because they are new to the City as of June 2010, long after the new WWTP under construction was designed and financed. The City's

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new WWTP is a tertiary treatment process, but even tertiary treatment is specifically designed to remove only BOD, TSS, turbidity, and pathogens per Title 22 of the California Code of Regulations, not metals and refractory organics. Removal of these constituents by tertiary treatment is incidental rather than by design. Thus, additional source control, treatment, and/or disposal facilities may be needed to achieve reliable compliance by design.

Table 1
City of Live Oak Compliance Assessment for Effluent Constituents

Constituent	Units	Effluent Limits								MEC ^(a) from Pond WWTP	Reliable Compliance with Draft Order?	
		Current Order			Current CDO	Draft Order					Pond WWTP	New WWTP
		Avg. Monthly	Avg. Weekly	Max. Daly	Avg. Daily	Annual Avg.	Avg. Monthly	Avg. Weekly	Max. Daily			
BOD	mg/L	10	15	20	--	--	10	15	20	--	No	Yes
	lbs/d	120	180	230	--	--	120	180	230	--	No	No ^(b)
TSS	mg/L	10	15	20	--	--	10	15	20	--	No	Yes
	lbs/d	120	180	230	--	--	120	180	230	--	No	No ^(b)
pH	Std.	6.5-8.5			--	6.5-8.5				--	Yes	Yes
Ammonia	µg/L	Floating			23.7	--	0.74	--	2.1	17.1	No	No ^(c)
Aluminum	µg/L	71	--	140	7,300	200	260	--	750	530	No	No ^(d)
Arsenic	µg/L	No limit			No limit	10	--	--	--	28.6	No	No ^(d)
Cadmium	µg/L	Floating			--	--	0.6	--	1.2	0.15	Yes	Yes ^(e)
Copper	µg/L	Floating			--	--	2.4	--	4.5	11	No	No ^(f)
Iron	µg/L	No limit			No limit	300	--	--	--	1210	No	No ^(d)
Manganese	µg/L	No limit			No limit	50	--	--	--	43.2	Yes	No ^(d)
Mercury	lbs/yr	No limit			No limit	0.057	--	--	--	0.071	No	No ^{(b) (d)}
Dibromochloromethane	µg/L	No limit			No limit	--	0.41	--	0.82	4.2	No	Yes
Dichorobromomethane	µg/L	No limit			No limit	--	0.56	--	1.2	28.2	No	Yes
Alpha BHC	µg/L	No limit			No limit	--	--	--	ND	0.022	No	No ^(d)
4,4'-DDE	µg/L	No limit			No limit	--	--	--	ND	0.012	No	No ^(d)
Alpha Endosulfan	µg/L	No limit			No limit	--	--	--	ND	0.008	No	No ^(d)
Endrin Aldehyde	µg/L	No limit			No limit	--	--	--	ND	0.008	No	No ^(d)
Total THMs	µg/L	No limit			No limit	80	--	--	--	--	No	Yes
Nitrate (as N)	mg/L	No limit			No limit	--	10	--	--	13.8	No	No
EC	µS/cm	No limit			No limit	900	--	--	--	1040	No	No ^(d)

- (a) MEC = Maximum effluent concentration. J = Estimated value reported below analytical quantitation limit.
(b) Wrong flows were used in calculation of mass limits based on design of new WWTP.
(c) New WWTP nitrification design is based on a maximum effluent pH of 8.0.
(d) There is no basis to assume the new WWTP will comply with this effluent limitation. Testing needs to be conducted.
(e) Even though the new WWTP loses the effluent concentration equalization effect of the old pond WWTP, the existing MEC is so low as to suggest compliance with the new WWTP will occur.
(f) The new WWTP is designed based on effluent hardness, not receiving water hardness.

Regarding ammonia, the new WWTP was designed to nitrify, but not to inappropriately low concentrations because of the cost to provide longer sludge ages and the associated need for larger secondary clarifiers. The City expected an ammonia effluent limitation based on an effluent pH no greater than 8.0, not the 8.5 value used in the PDWDRs. There is no reason that a nitrifying activated sludge WWTP effluent should have a pH greater than 8.0 other than either pH meter error or excessive alkaline chemical addition, which the City cannot do because it has no alkaline addition facilities. As you know, many nitrifying activated sludge WWTPs must add alkaline chemicals to keep the effluent pH above 6.5 to sustain nitrification. With the City's potable groundwater supply, lime addition is not expected to be necessary. If the City is forced to a potable surface water supply for WDR salinity, arsenic, or other reasons, then lime addition will be a likely consequence.

The new activated sludge WWTP is not expected to necessarily achieve reliable compliance with PDWDR effluent limitations on BOD and TSS mass, ammonia, aluminum, arsenic, copper, iron, manganese, mercury, alpha BHC, 4,4'-DDE, alpha endosulfan, endrin aldehyde, nitrate, and EC. The need for interim effluent limitations for the existing pond WWTP until the new WWTP is completed and made operational was justified at the time that the City's current CDO was adopted. The need for interim effluent limitations for the new WWTP is discussed in the following sections, limitation-by-limitation, with a schedule for compliance/resolution for each.

BOD AND TSS MASS LIMITATIONS

The new WWTP was designed to handle peak day, peak week, and peak month flows and produce BOD and TSS concentrations not exceeding 10 mg/L and 10 mg/L, respectively, (or an average daily turbidity of 2 NTU) under these worst-case, I/I-based flows. The PDWDR mass limits of 120, 180, and 230 lbs/day under max month, max week, and max day flows of 3.33, 3.80, and 4.27 Mgal/d require effluent concentrations of 4.3, 5.7, and 6.5 mg/L, respectively, which the new WWTP was not designed to meet, and which provide no known benefit to the environment under conditions causing high I/I flows. Other recently adopted permits have recognized this issue and only require compliance with mass limits during dry weather, normal groundwater and no runoff.

The City's action plan to achieve compliance with BOD and TSS mass limitations is as follows:

1. Revise to WDRs to reflect what the City believes to be the appropriate and protective mass limits. This can be achieved by either changing the mass limits to the appropriate values, or changing the WDR compliance assessment language to reflect that these mass limitations apply only during ADWF months. Available venues to address this concern include the Regional Board, State Board, and judiciary.
2. That failing, the City will start up the new WWTP and attempt to stress test it in the Winters of 2012/13 and 2013/14 to make an educated guess as to whether compliance with these mass limits under design flows is possible. This testing will only simulate high flows, but cannot take into consideration all factors during high flow events such as influent characteristic changes, lower temperatures, lower alkalinity, activated sludge biomass changes such as volatile solids percentage reduction, sludge volume index reduction during high flow events, other settling characteristic changes. Historical stress tests are short duration, one day, and will not be representative of a longer duration storm event.

3. If reliable compliance does not appear likely, then the City will begin to plan improvements to the new WWTP in 2014.

The schedule for compliance will depend on whether the City achieves success with Action Plan 1 or 2. Compliance is expected by September 2015 (forecast NPDES permit renewal date), unless protracted litigation is needed, or the City must design expanded clarifiers and filters to produce effluent BOD/TSS concentration not exceeding 4 mg/L.

AMMONIA

The new WWTP nitrification system was designed to produce effluent ammonia concentrations less than 1.0 mg-N/L under worst-case, high flow, low temperature, and low alkalinity (from high I/I) wastewater conditions based on an effluent pH of no more than 8.0. The City's action plan to achieve compliance with ammonia limitations is as follows:

1. Revise the WDRs to reflect a maximum effluent pH of 8.0. The City expects to provide substantial evidence that effluent pH from an oxidation ditch-type activated sludge process that does not need alkalinity addition should not exceed 8.0. It has been reported that there are other wastewater facilities that have exceeded a pH of 8.0. Upon conversation with a plant, Olivehurst Public Utilities District, it was determined that their high pH is related to caustic soda feed in the collection system. Without caustic feed the pH is consistently less than 8.0. Live Oak does not use caustic in the collection system or at the wastewater facility. It is appropriate to permit the facility a maximum pH of 8.0 and not use OPUD as a comparable operational scheme. Other facilities that should be reviewed include Lincoln or Colusa. The City currently has acid addition facilities for the existing photosynthesis-based pond WWTP that can be installed in the new WWTP, if needed, to provide a level of pH surety deemed appropriate by the Regional Board. If the data from OPUD is to be utilized as a comparable facility it would also be appropriate to allow the City of Live Oak to control effluent pH to below 8.0 in that the high pH values at OPUD were caused by chemical addition.
2. That failing through the appropriate venues, the City will start up the new WWTP and attempt to stress test it with regards to maximum natural pH values (no chemical addition), and maximum ammonia concentration (as limited by temperature, sludge age, SVI [sludge volume index], and secondary clarifier size [as driven by SVI]). If the new WWTP can provide the Regional Board with new information that natural effluent pH values are consistently less than 8.0, then the City will request that the effluent limitations be revised based on new information. This start-up testing will take 2 years due to the temperature relationship and ammonia removal efficiency. It is anticipated that the plant will be most stressed during cold weather and storm events. Testing and plant optimization will take place during the winters of 2012/13 and 2013/14.

If reliable compliance does not appear likely, then the City will begin to plan improvements to the new WWTP in 2014/15. As with the BOD/TSS mass limitations, the schedule for compliance with ammonia limitations depends on the City's success with the foregoing plans. Planning including design, environmental review and approval, financing, Proposition 218 rate increase process,

construction and start-up will be completed by fall 2017 unless protracted litigation or a revised design is needed.

ALUMINUM

As noted in Table 1, there is no basis to assume that the new WWTP will comply with the aluminum effluent limitations. The current pond WWTP maximum effluent concentration (MEC) is 530 µg/L, as total aluminum. The acid-soluble aluminum concentrations should be less. The amount of pond WWTP effluent aluminum resulting from air deposition of soil from area farming operations is unknown. Air deposition will be less with the new WWTP. The coefficient of variation (CV) for acid-soluble effluent aluminum concentrations from the new WWTP may be less, which will alter the SIP-based effluent limitation calculation process.

The City's plan for compliance with the aluminum effluent limitations is as follows:

1. Dispute the use of a maximum contaminant level (MCL) water quality objective (WQO) for a receiving water that does not have a MUN beneficial use designation under Regional Board precedent, the Basin Plan, or Resolution No. 88-63. The City plans on providing significant comments related to the inappropriate designation of the Reclamation District 777 Drain Number 1 as MUN. .
2. Regarding the aquatic life WQO for aluminum, the new WWTP should be fully operational by the end of 2012. The new WWTP does not use alum as a coagulant, so readily implementable source control for aluminum is unlikely.
3. Collect monthly effluent aluminum samples from the new WWTP throughout 2013, i.e., 12 samples, enough for a new WWTP-specific CV determination per SIP.
4. Determine if reliable compliance with the currently proposed effluent limitations, or new WWTP-specific effluent limitations based on new information from the new WWTP is likely, by April 2014. If reliable compliance is likely, request that the WDRs be amended, as needed, to reflect the new information.
5. If reliable compliance is not likely, then perform a Phase 1 acute water effect ratio (WER) for aluminum in the latter half of 2014, concurrent with any other WERs needed as a result of the new WDRs. WER results should be available by early 2015 for inclusion in the City's Report of Waste Discharge to renew the NPDES Order in September 2015. The results of this expensive test will most likely indicate no toxicity at an order of magnitude higher aluminum levels.

ARSENIC, IRON, MANGANESE, AND NITRATE

The new WWTP was not designed to remove these constituents, which heretofore have not been applied to the City's receiving water under the Basin Plan or Resolution No. 88-63. For these constituents, the City's action plan is as follows:

1. Dispute the use of MCL-based WQOs for a receiving water that does not have an MUN beneficial use under Regional Board precedent, the Basin Plan, or Resolution No. 88-63.

2. In the event that the subject limitations are not removed from the WDRs, the City will need to study several courses of action:
 - a. In 2013, study effluent quality from the new WWTP to determine if reliable compliance with these effluent limitations is possible.
 - b. If reliable compliance with all of these effluent limitation is not possible, then determine if it is more cost effective to:
 - i. Pipe the effluent to the Sutter Bypass where MUN is specifically excluded.
 - ii. Pipe the effluent to the Feather River where dilution credits may be available.
 - iii. Reclaim effluent seasonally along the pipeline route to the Feather River.
 - iv. Upgrade the WWTP to remove arsenic, iron, and/or manganese using potable water treatment technologies, and/or remove nitrate via denitrification.

Regarding schedule, a legal ruling or Basin Plan amendment on the propriety of the MUN designation may take three years from proposed DPWDR adoption in September 2010. If the City does not prevail, and the 2013 effluent data suggest a compliance problem, then the City would need to study the aforementioned alternatives in 2014. The City's current Master Plan calls for eventual discharge to the Feather River; therefore, this is expected to be the best apparent plan though this cannot be assumed with evolving regulations. A Report of Waste Discharge should be filed to receive effluent limitations for one or more of the alternatives listed above in 2015. Design, financing, and construction of the needed improvements to meet the effluent limitations resulting from the 2015 Reports of Waste Discharge may take until 2017.

Copper

The new WWTP is not expected to comply with an effluent limitation for copper based on receiving water hardness. For copper, a concave-down CTR metal, the City believes effluent hardness is the appropriate basis for regulation to prevent the effluent discharge from causing or contributing to an exceedance of the copper WQO in the receiving water. The City's plan for compliance with copper effluent limitations is as follows:

1. The City will request effluent copper limitations based on effluent hardness during the Tentative Order comment period, and provide evidence in support of this request.
2. In addition, in 2013 the City will collect monthly data from the new WWTP to determine its performance in removing copper. With 12 data, a WWTP-specific CV for the new WWTP can be developed and used to re-calculate copper effluent limitations based on this new information.
3. Therefore in early 2014, it will be known whether the new WWTP should comply reliably with revised effluent copper limitations based on new information.
4. If reliable compliance does not appear likely, then a Phase 1 WER for copper will be necessary. If copper is the only metal in need of a WER, then the stream-lined WER will be used. If WERs are needed for other metals, then a conventional Phase 1 WER will be

conducted. The WER should be complete by early 2015 in time for inclusion in the Report of Waste Discharge due no later than March 2015 to renew the NPDES Order by September 2015.

Mercury

Reliable compliance with the new mass limitation on mercury is uncertain because there are no data from the new WWTP. It is unknown whether a pond process with its large settling area, photosynthetically-driven pH swings, and huge biological mass will remove more or less mercury than an activated sludge process with filters. New WWTP effluent data from 2013 and 2014 will allow calculation of two annual mercury mass loads on the receiving water. If reliable compliance appears likely, then this new information will be reported in the early 2015 Report of Waste Discharge. If reliable compliance appears unlikely, the City must re-evaluate the possibilities of source control, evaluate mercury removal processes (other than reverse osmosis), and consider effluent reclamation as a likely compliance strategy to reduce the annual mass of mercury discharged to surface waters.

Pesticides

As with mercury, it is not known whether the new WWTP will comply with the new effluent limitations on alpha BHC, 4,4'-DDE, alpha endosulfan, and endrin aldehyde until substantial data are available from the new WWTP. These pesticides should not have been detected in pond WWTP effluent, which leaves possible causes of the reported detections being:

- False positive values from the analytical laboratory.
- Air deposition in ponds from residuals still in area agricultural soils.
- Leaching from pond bottom sludges.
- Leaching from area soils via I/I.
- Actual commercial/residential sources.

By the end of 2014, the City will have two years of data from the new WWTP. These data plus a critical review of the pond WWTP data should provide evidence as to whether the new WWTP should or should not be able to comply with these new effluent limitations reliably. If a compliance problem exists that cannot be corrected via source control (which is unlikely, there are rarely point sources of these pesticides these days), then installation of ozonation facilities would appear to be necessary as the more cost effective alternative to complete land containment of effluent.

Electrical Conductivity (EC)

Compliance with the PDWDR effluent limitation on EC is unlikely considering the City's potable groundwater supply. The City's action plan to achieve compliance consists of:

1. Attempt to revise the EC effluent limitation during the Tentative Order hearing process.
2. Collect one year of effluent EC data in 2013 from the new WWTP to assess probable reliable compliance with the new EC effluent limitation.

3. If reliable compliance is not probable, then check the WWTP influent flow for morning chloride concentration spikes to determine the probable extent of self-regenerating water softener (SRWS) use in Live Oak, and the possible extent of EC reduction plausible by banning SRWSs.
4. Also analyze I/I data to determine if I/I is a significant source of EC.
5. If there are no other plausible means to achieve compliance with EC effluent limitations, ban use of self-regenerating water softeners in the City.

The study of new WWTP effluent EC, Total Dissolved Solids (TDS), and Fixed Dissolved Solids (FDS) data, and the sources of the salinity being measured should be complete by early 2014 if all new monitoring is undertaken concurrently rather than serially. If I/I is a major source of salinity that must be addressed beyond current I/I control measures in order to be able to ban SRWs, if needed, then compliance with salinity effluent limitations will take several years beyond 2013, realistically between five and ten years beyond 2013. If the City has lawful justification to begin a ban on SRWSs in 2014, then compliance with salinity effluent limitations should be achievable between 2015 and 2016.

POLLUTION PREVENTION PLAN

Based on the PDWDRs, though not adopted at this time, the City has begun the process of preparing a Pollution Prevention Plan to get a head start on achieving compliance with effluent limitations as quickly as possible. There are many possible compliance strategies as noted in this Infeasibility Analysis. The main impedance to completing the Pollution Prevention Plan in the near-term future is the inability to test new WWTP treatment performance until roughly 2013. Based on the 2013 data (and possibly the 2014 data for elusive constituents [e.g., pesticides] and for constituents with annual averaging periods), serious pollution control measures should be possible starting in 2014/2015.

REVIEW AND JUSTIFICATION OF PROPOSED COMPLIANCE SCHEDULE

A bar chart showing various activities being planned by the City relative to the PDWDRs and achieving reliable compliance with WDRs (as proposed or revised) is presented in Figure 1. The compliance schedules for the various effluent limitations involved are believed to be as short as is realistic, with the time at which compliance is achieved being dependent on whether the City's proposed compliance actions are successful. Many compliance issues may be resolved by, or at, the September 2010 Tentative Order hearing. The need for compliance with MUN effluent limitations may be determined by a Basin Plan amendment or by trial, which is expected to take up to three years. If the City does not prevail in the amendment or at trial, then new source control, treatment, and/or disposal facilities will be needed. For non-MUN effluent limitations, the City needs to collect data from the new WWTP currently under construction and scheduled for start-up in 2012. Start-up of an extended aeration activated sludge process operated in a mode to try to maximize simultaneous nitrification/denitrification (per the new nitrate requirement of the PDWDRs) is expected to take at least two years to collect reliable data during critical cold weather months; the WWTP was not designed for denitrification based on current WDRs. Therefore adequate operational data for some constituents from the new WWTP are not expected to be available until early 2015. That is when a

first realistic assessment of compliance with effluent limitations developed for the new WWTP (i.e., with an appropriate CV) is possible. If reliable compliance with appropriate metals effluent limits is not probable, then 2014 would be used to conduct WERs, if appropriate, and/or develop other compliance strategies under the City's Pollution Prevention Plan.

SUMMARY

In summary, though compliance may be achieved as early as September 2010 via revision of the PDWDRs, compliance for many constituents may take until 2016 or 2017 based on a year or more of representative data from the new WWTP not being available until 2014. Compliance with some effluent limitations may need more than two years from early 2014 if the actions required of the City to comply include major design, CEQA, financing, and construction of additional collection system improvements, new treatment processes, and/or new disposal facilities (e.g., new reclamation facilities and/or pump stations, pipelines, and diffusers in alternative receiving waters).

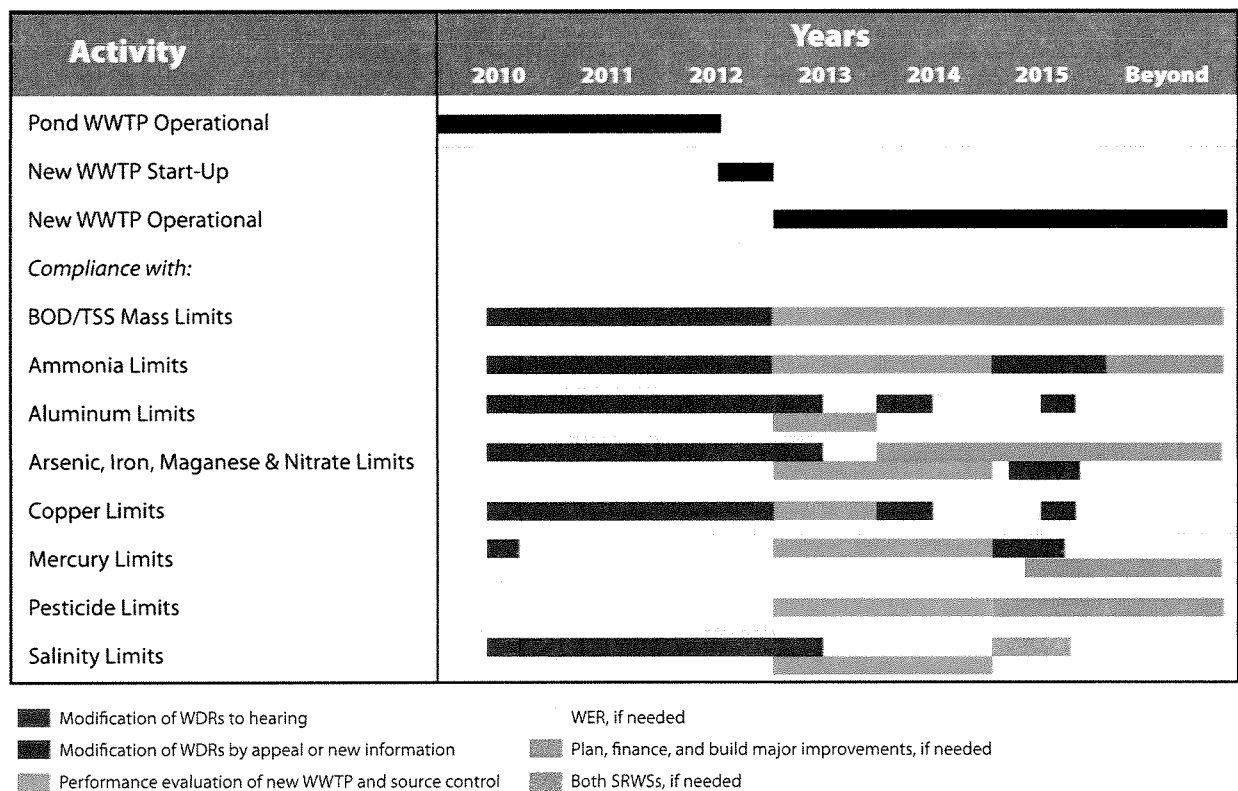


Figure 1
Preliminary Compliance Strategy and Schedule

As you are aware, the City of Live Oak is not an affluent community. The PDWDRs including new effluent limitations in 2010 based on a 1988 resolution after the City has just designed and begun construction of a new tertiary activated sludge WWTP is difficult to comprehend. I will be

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informing the City Council and people of this change in regulation as soon as possible so that as a City, we can take appropriate steps with our constituency's support: philosophical and financial. As noted, the City has already begun action to facilitate compliance with all WDRs as quickly and as appropriately as possible. Please feel free to call if you have any questions.

Sincerely,

A handwritten signature in cursive script that reads "William P. Lewis".

William P. Lewis
Public Works Director

CC City Manager
Mike Harrison Eco:Logic